

## Experience With An Imaging Infrared Radiometer In A Simulated Space Environment

G. Siebes, K. Johnson, D. McAfee  
Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, California

### Abstract

A commercially available imaging infrared radiometer, an Inframetrics 760 system, was subjected to a simulated space environment in JPL's 25 ft space simulator. The IR camera is integral part of the STAR (Satellite Test Assistant Robot) system which demonstrated successful operation in late 1994. During this demonstration the IR camera experienced 24 hours of a hard vacuum with simulated space temperatures between  $-185^{\circ}\text{C}$  to  $+25^{\circ}\text{C}$ . Equipped only with heaters to prevent undercooling, the IR camera operated continuously during this period and provided numerous images of the simulator interior and of a reference target. The reference target consisted of ten samples of different materials, selected to cover an emittance range from 0.03 to 0.90. Target temperatures measured with the IR radiometer compared to within  $3^{\circ}\text{C}$  of independent, thermocouple measurements for target temperatures as low as  $-70^{\circ}\text{C}$ . Subsequent postprocessing, including emittance correction techniques, resulted in further improvement.